What is claimed is:

1. A method of fabricating a semiconductor device having trenches comprising:

a mask forming step comprised of sequentially forming a first insulating film and a second insulating film on a semiconductor substrate, followed by forming a mask for forming trenches on the second insulating film by patterning so as to expose a surface area of the second insulating film corresponding to each trench formed on the semiconductor substrate;

a trench forming step comprised of etching a portion extending from the surface area of the exposed second insulating film to an in-depth part of the semiconductor substrate using the mask for forming trenches, thereby forming the trenches on the semiconductor substrate;

a depositing step comprised of removing the mask for forming trenches, followed by depositing a third insulating film by filling a third insulating film into each trench up to the height to cover the second insulating film;

a second oxide film forming step comprised of subjecting the semiconductor substrate at a cornered portion of each trench to thermal oxidation after the depositing step, thereby forming a second oxide film;

a planarizing step comprises of polishing and planarizing the third insulating film so as to expose the second insulating film; and

an element isolation portion forming step comprised of removing the

second insulating film and the first insulating film, followed by etching the third insulating film such that a part of the third insulating film remains inside each trench, thereby forming element isolating portion;

2. The method of fabricating a semiconductor device having trenches according to claim 1, further including a first oxide film forming step comprises of subjecting an inner wall of each trench to a thermal oxidation which is performed after the trench forming step is performed and before the depositing step thereby forming a first oxide film.

3. The method of fabricating a semiconductor device having trenches according to claim 1, wherein the planarizing step is performed before the second oxide film step is performed.

4. The method of fabricating a semiconductor device having trenches according to claim 1, wherein the first insulating film is a silicon oxide film and the second insulating film is a silicon nitride film.

5. The method of fabricating a semiconductor device having trenches according to claim 1, wherein the third insulating film is a silicon oxide film.

6. The method of fabricating a semiconductor device having trenches according to claim 4, wherein the third insulating film is a silicon oxide film.

7. The method of fabricating a semiconductor device having trenches according to claim 1, wherein the third insulating film is formed by

an HDP-CVD method.

8. The method of fabricating a semiconductor device having trenches according to claim 5, wherein the third insulating film is formed by an HDP-CVD method.

9. The method of fabricating a semiconductor device having trenches according to claim 6, wherein the third insulating film is formed by an HDP-CVD method.